

Appendix C

Cost Information

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COST INFORMATION

This Appendix provides a summary of available information about costs associated with the Irrigated Lands Conditional Waiver Program (Program). The summary includes available information about costs to dischargers for the Conditional Waivers' Monitoring and Reporting Programs (MRPs), management practice (MP) implementation, and fees. The summary also provides information about the costs incurred by state agencies, such as funding provided by the State Water Resources Control Board (State Water Board) for monitoring, assessment, and Program oversight. This summary also provides information about the potential for cost offsets through State Water Board programs.

Costs associated with the Program in the future may vary considerably due to uncertainties in several key areas of the Program, including the number of functional Coalition Groups that growers maintain or form; the total number of individual dischargers that file for individual coverage; the size of Coalition Group coverage areas and individual farms; the total number of monitoring sites required to evaluate the effects of discharges from irrigated agriculture on surface waters; the number of water quality exceedances; efforts to identify sources of water quality effects; the nature and extent of MPs that will be required to address exceedances; and the availability of federal, state, and local funding of monitoring and MP implementation costs.

For this summary, staff reviewed the 2003 Conditional Waivers case file, existing monitoring contracts for Phase I and Phase II University of California (UC) at Davis monitoring, the State Water Board documents supporting the State Water Board Program fees, and cost estimate documents developed by the Central Coast and Los Angeles Water Boards. Staff also contacted a limited number of other parties conducting monitoring for Coalition Groups.

ESTIMATED COST FOR MONITORING AND REPORTING PROGRAM

Water Board staff has estimated the costs associated with MRPs required by both the Coalition Group and Individual Discharger Conditional Waivers and has reviewed monitoring conducted with State Water Board funding. This overview includes cost estimates for sampling the required constituents of concern, analyzing the samples, and reporting the results of the sampling analysis given the limitation notes above.

Monitoring

Over the past four years, the Central Valley Water Board has implemented two monitoring programs to investigate the effects of discharges from irrigated lands on surface waters in the Central Valley Region. Both programs were performed utilizing funding from the State Water Board under contract with the UC. Phase I monitoring costs were \$497,000 over a two-year period. This project sampled 24 unique sites for toxicity using two test species and using toxicity identification evaluations (TIEs) to determine the likely cause of the toxicity. Water column samples were collected monthly using a fixed schedule in which each site was sampled for toxicity about every three weeks beginning in March. When toxicity was observed, the site was re-sampled within 48 hours. In order to estimate the duration of toxicity at that site, the sample sites continued to be monitored at the increased frequency until no toxicity was observed in samples from that site. There were a total of 204 sample site visits for water column during Phase I.

For Phase I, an additional 17 monitoring sites were also selected for sediment monitoring. These samples were tested for toxicity to *hyalella azteca* and chemistry monitoring for pyrethroids,

chlorpyrifos, and organochlorines. These sites were monitored two times each with a total of 34 site visits at a cost of \$40,000 or \$1,100 per site.

The Phase I project demonstrated that toxicity testing is an effective assessment tool that can identify the type of stressor that affects water quality, as well as the duration, magnitude and frequency of the effects. The total cost of the Phase I water column monitoring, which included TIE, multiple resampling where toxicity was found, and report development was \$497,000, or about \$2,400 per site visit. The total cost of Phase I sediment monitoring effort was \$40,000, or about \$1,100 per site, including development of the summary report.

The Water Board also initiated the Phase II project through the UC, which is still in progress and will not be completed until December 2006. The Phase II project includes a third species (*selenastrum*) for the water column toxicity and adds the tests for general water quality parameters, pesticides, metals and nutrients on the same water samples collected throughout the Central Valley Region. TIEs were processed on water samples found to be toxic, and the dormant season monitoring under Phase II was extraordinary in its completeness. Dormant season monitoring included investigating peak loadings during storm events. Up to 15 monitoring sites were monitored extensively with up to 4 samples collected daily during the first 4 days of a storm, and two samples collected immediately after the storm ceased. The Coalition Group MRP does not require the same extensive process.

The Phase II project collected water samples at about 41 sites in 2004 and about the same number (although often not the same locations) in 2005. Each sample site was visited at a probable average of six times per year, or about 984 site visits during the first two years. At a total invoiced (or pending invoice) cost of \$2,209,000, the Phase II water samples cost approximately \$2,300 per site. The Phase II project also monitored sediment for toxicity and for specific pesticides at 86 unique sites, and each site was visited from one to five times each for a total of 121 site visits. The costs associated with a sediment toxicity sampling event in Phase II is estimated to be \$350,000. Analysis of a sediment sample for toxicity and for pesticides of concern is estimated to be \$2,400 per site.

The total average cost of collecting, analyzing, and reporting the results of both water and sediment as implemented under the UC Phase I and Phase II contracts for a single monitoring event is \$4,700. These costs also include submittal of data in an electronic format and written reports on a quarterly basis, as well as some additional investigative evaluation (such as the intensive dormant season monitoring) that is not required for Coalition Group monitoring. These costs do not contain factors associated with the submission of exceedance reports, communication reports, and other reports required to address identified water quality concerns. The Coalition Group MRP also requires sediment monitoring only two times per year, as opposed to the higher frequency required for water column monitoring. The Coalition Groups do not conduct sediment and water column analyses during every sample event.

The Coalition Group MRP requires monthly water monitoring during the irrigation season and two times during the wet weather season. Sediment monitoring is required two times per year. Currently, staff does not have specific water quality monitoring costs for any existing Coalition Group, but this cost could be conservatively estimated using the cost data from the UC Phase I and Phase II contracts. If the UC contract costs, which are conservative on the high side, are utilized in this summary, and if Coalition Groups collect a sample at each site six times per year for water samples and two times per year for sediment, the estimated cost per site would be \$29,000 per year per site.

If the cost of the Water Board's Phase II monitoring effort is extrapolated to the estimated number of Coalition Group water and sediment monitoring sites (84 sites in September 2005), the Coalition Group monitoring can be estimated to be \$2,436,000 for both water and sediment.

Reporting

Coalition Group Watershed Evaluation Reports (WER) and MRP Plan

Staff estimates that the initial WER and MRP Plan will require 200 hours at \$75 per hour. During the course of the MRP, each Coalition Group will be required to submit at least one initial WER and MRP Plan. Updates to the WER and MRP Plan should take substantially less time, if needed. Therefore, the total cost for the initial WER and MRP Plan is about \$15,000 per group. If the group's coverage areas is small and has technology like GIS, this cost would be significantly less (< \$3,000).

Quality Assurance Program Plan (QAPP) required by MRPs

Staff concurs with estimates presented by the Los Angeles Water Board. Each QAPP will require 80 hours at \$75 per hour. During the course of developing the MRP, each group will be required to submit a QAPP for approval. Therefore, the cost to develop a QAPP is about \$6,000 per group.

Semi-Annual Monitoring Report (SAMR)

Staff estimates that each SAMR will require 40 to 80 hours at \$75 per hour. Each group is required to submit the SAMR two times a year. Therefore, the cost for the SAMR is estimated to range from \$3,000 to \$6,000 per group, per submittal. Many factors can increase or decrease this cost. These factors may include size of groups, number of monitoring sites, sampling results, water quality exceedances, and data management.

OTHER COSTS ASSOCIATED WITH THE CONDITIONAL WAIVERS

Administrative Costs

Administrative costs associated with the Conditional Waivers incurred by dischargers are currently unknown. Typically, much of the administrative requirements associated with MRPs, such as data management, are included in the costs associated with the MRP. The Central Valley Water Board has about 12 person years per year allocated and supported by fees collected by the State Water Board.

State Fees

The annual fee for conditional waivers for discharges from agricultural land is \$100 per farm plus \$0.50 per acre of land. If a discharger joins a Coalition Group that manages fee collection and payment, the proposed fee is \$100 per group plus \$0.25 per acre of land. The Surface Water Ambient Water Monitoring Program surcharge does not apply to annual fees for waivers as specified in the California Code of Regulations, Title 23, Division 3, Chapter 9, section 2200(a)(3).

MANAGEMENT PRACTICE COST ESTIMATES

Staff has reviewed the cost estimates for MPs conducted by the Los Angeles Water Board. Staff believes that cost estimates for the Los Angeles Region would apply in the Central Valley Region and has summarized those costs below.

The following descriptions of MPs serve as a summary of possible costs, but do not constitute a Water Board recommendation or approval of specific MPs.

(a) *Sediment Containment*: Where pollutants may adhere to the sediment, sediment controls may be utilized. Examples are contour furrowing, vegetative strips within the crops or at the edge of the waterway, and settling basins. A more complete list is available from the Federal EQIP program.

Costs: Conservation cover \$1,000/acre*, sediment basin \$5,000/each* or \$700-\$1,000,000/each**, tail water recovery \$4,500-\$25,000/each**, filter strip \$400/acre* or \$375-\$12,500/acre**, mulching \$600/c*, cut bank stabilization \$2,500/½-mile* or \$125-\$12,500/each**

* Costs specified in the 2004 Federal EQIP program with the National Resource Conservation Service (NRCS)

** Costs specified in the 1998 USDA Colleagues Creek Watershed Erosion and Sediment Plan for Mug Lagoon

(b) *Fertilizer Use*: Where fertilizer or amendments are used, the MP would be an improvement in estimating the amount of fertilizer required. Examples are leaf testing, soil testing, and changes in fertilizer application methods to maximize uptake.

Costs: Nutrient management \$32/acre*, cover crop \$10-\$230/acre**

Moderate Potential to Reduce Water Quality Problems: Initial results from a State Water Board grant study by United Water Conservation District, currently on-going in the Los Angeles Region, show that many growers do not apply fertilizer at a rate and at a time that can best be utilized by the crop. Specifically, the fate of excess fertilizer is not well understood. Alternately, some growers report that the high cost of fertilizer means that growers only apply the minimum amount necessary to ensure an economic crop and that shared and historical information is heavily utilized to ensure accurate application amounts. UC Cooperative Extension and NRCS provide training and information on control methodology for fertilizer application.

(c) *Irrigation efficiency*: Where runoff is seen or where groundwater surfaces in the vicinity of the farm, improvements in water application may result in no flow and no pollutant load leaving the property. The MP would be a more accurate measurement of water requirements through soil and plant testing, antecedent soil moisture content testing, etc.

Costs: Improved water application \$10/acre*, controlled drainage \$25/acre*, conservation tillage \$5-\$10/acre**, irrigation system \$850-\$3,600/each**.

Moderate Potential to Reduce Water Quality Problems: Los Angeles Water Board staff discussions with local experts indicate that over irrigation is common because of the '24-hour' rule, where purchased water will only be supplied for a fixed period of time. Further, standard irrigation practice is based on water use at certain times of day and according to historic practices. More advanced testing of plant requirements is lacking. Growers report that the expense of water ensures good irrigation practices and water-saving efforts. As an example, conservation practices such as mini-sprinklers are widely used. UC Cooperative Extension and NRCS advisors report that extensive information is available on improving irrigation practices and that responsible use varies greatly among water users.

(d) *Pesticide handling*: Where a tested pesticide is in use, the operator may provide greater controls on the storage, transport, and cleanup of the process.

Costs: Greater care and documentation with existing facilities.

(e) *Pesticide application change*: Where a tested pesticide is applied, the grower could change the application process, extent or timing relative to rain or irrigation.

Costs: Replacement pesticide or process changes are assumed to have similar costs.

Uncertainties about both the current extent of MP implementation and the extent of MP implementation that will be required to address water quality impairments limit the accuracy of Los Angeles Water Board staff's cost estimate. Their findings can be reviewed at www.waterboards.ca.gov/losangeles.

Staff finds that implementation of the above MPs may result in increased sampling, monitoring and reporting costs, if additional sampling is required to evaluate the effectiveness of the MP. Also, maintenance costs may be associated with some MPs, such as removing accumulated sediment from newly established sediment basins. Staff finds that quantifying any increase in sampling, monitoring, reporting, or maintenance costs due to MP implementation involves too many assumptions and, therefore, Water Board staff is unable to provide a range or magnitude of possible costs. It is possible that net costs may decrease as a result of successful MP implementation.

COST OFFSETS FOR CONDITIONAL WAIVER

Coalition Groups and individual dischargers may reduce costs by acquiring funding from other sources. Agriculture water quality grants are available for projects that reduce or eliminate nonpoint source pollution discharged from agricultural lands to surface water. Growers, nonprofit groups, and/or educational institutions within the Central Valley Region have been awarded at least \$13 million from the Agriculture Water Quality Grants Program (AWQGP), which provides funding for both monitoring and implementation projects. More information may be found on AWQGP at the following web site: <http://www.waterboards.ca.gov/funding/awqgp/index.html>.

In addition to grant opportunities and other funding opportunities, it is likely that the implementation of MPs will yield significant benefits to the agricultural community. Erosion control measures and improved irrigation practices may reduce soil loss from agricultural lands. Topsoil retention is a significant benefit, allowing for lower levels of soil amendment and fertilization, thus lowering overall costs. Also, improved irrigation practices may reduce water costs. The planting of filter strips can attract beneficial insects and can eventually reduce pesticide use, thus further reducing overall costs. Although the staff is unable to quantify the total benefits expected from the implementation of MPs, it is very likely that benefits will accrue and that these benefits will help to offset the costs imposed by the Conditional Waiver.